

## *Typilobus kishimotoi*, a new leucosiid crab (Crustacea: Decapoda: Brachyura) from the Miocene Katsuta Group, Japan

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**Abstract.**—*Typilobus kishimotoi*, new species, a crab of the family Leucosiidae, is described from the middle Miocene Katsuta Group in Okayama Prefecture, southwest Japan. The discovery of the species shows that *Typilobus* had reached Japan, on the west side of the North Pacific, by middle Miocene.

*Typilobus* was established within the family Leucosiidae Samouelle, 1819, by Stoliczka, 1871, based on a single species, *Typilobus granulosus* Stoliczka, 1871, from the Lower Miocene of Pakistan. Since then, *Typilobus* spp. have been recorded from the Eocene–Miocene of Europe, the Miocene of Egypt, and the Miocene of Sabah (Glaessner 1969, Quayle & Collins 1981, Förster & Mundlos 1982, Morris & Collins 1991, Müller 1993). Although *Typilobus* is an extinct genus, Via Boada (1969: 422), Quayle & Collins (1981: 743) and Förster & Mundlos (1982: 163) suggested that the genus is closely related to the extant leucosiid genera, *Randallia* Stimpson, 1857, and *Philyra* Leach, 1817.

In this paper a new species of *Typilobus* from the Japanese Miocene is described. The specimens were collected from silty sandstone within the Yoshino Formation of the Katsuta Group exposed at Mino (Loc. T.A.-34 of Kishimoto 1995) and Tanaka (Loc. T.A.-37 of Kishimoto 1995), Katsuou-cho, Katsuta-gun, Okayama Prefecture (Fig. 1). According to Yoshimoto (1979), the Katsuta Group is assigned to Zones N. 8b-9 (earliest middle Miocene) of Blow's (1969) scale of planktonic foraminifera. Karasawa & Kishimoto (1996) reported four additional decapod species, *Cancer sanbonsugii* Imaizumi, 1962, *Scylla* sp. aff. *S. serrata* (Forskål, 1775), *Carcinoplax antiqua* (Ristori, 1889), and *Miose-*

*sarma japonicum* Karasawa, 1989, from both localities. Among these, *C. antiqua* and *M. japonicum* are predominant. The decapod assemblage suggests a depositional environment within the upper sublittoral zone on a sandy bottom (Karasawa & Kishimoto 1996).

### Systematics

Section Heterotremata Guinot, 1977  
Superfamily Leucosioidea Samouelle,  
1819

Family Leucosiidae Samouelle, 1819  
Genus *Typilobus* Stoliczka, 1871

*Type species.*—*Typilobus granulosus* Stoliczka, 1871, by monotypy.

*Geologic range.*—Middle Eocene–Middle Miocene.

*Typilobus kishimotoi*, new species  
(Fig. 2)

*Philyra* sp.—Kishimoto, 1995: 49, pl. 7,  
figs. 1–5.

*Typilobus* sp. nov.—Karasawa & Kishimoto, 1996: 46, fig. 12.

*Material examined.*—MFM39017 (holotype), carapace length 14.4 mm × carapace width 17.1 mm, Mino, Katsuou-cho, Katsuta-gun, Okayama Prefecture.—MFM39018 (paratype), carapace length 10.6 mm × carapace width 11.5 mm, Tanaka, Katsuou-cho, Katsuta-gun, Okayama Prefecture.

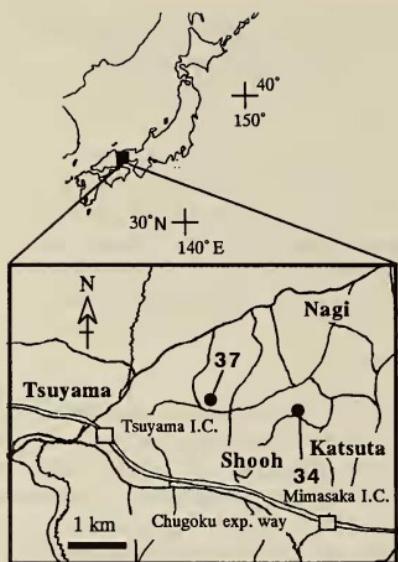


Fig. 1. Locality map.

**Etymology.**—The specific name is dedicated to Mr. S. Kishimoto who first reported the present species.

**Description.**—Large sized *Typilobus*, up to 17 mm carapace width. Carapace transversely oval in outline, length about  $\frac{4}{5}$  its width, widest about midlength. Carapace of small specimen (12 mm in width) subovate in outline, slightly wider than long. Orbitofrontal margin sulcate, upturned, occupying about  $\frac{1}{4}$  of carapace width. Orbit small, concave with small postorbital spine. Anterolateral margin convex; lateral margin developed as thin edge from weak cervical notch to lateral tubercle. Lateral tubercle bluntly rounded, slightly upturned, situated posterior to mid-carapace length. Postero-lateral margin nearly straight, about  $\frac{1}{5}$  length of anterolateral and lateral margins, with small, bluntly rounded tubercle of which tip is directed dorsally and anteriorly. Posterior margin slightly convex, as wide as orbitofrontal margin, posterior angle with small, bluntly rounded tubercle. Dorsal surface of smaller specimen moderately convex, densely covered with small granules of variable diameters, but internal mould of carapace of larger specimen finely pitted. Postorbital depression with two lon-

**Diagnosis.**—Carapace large, transversely oval in outline, dorsal surface with 2 longitudinal ridges on the postfrontal depression, and with small tubercles on mesogastric and mesobranchial regions.

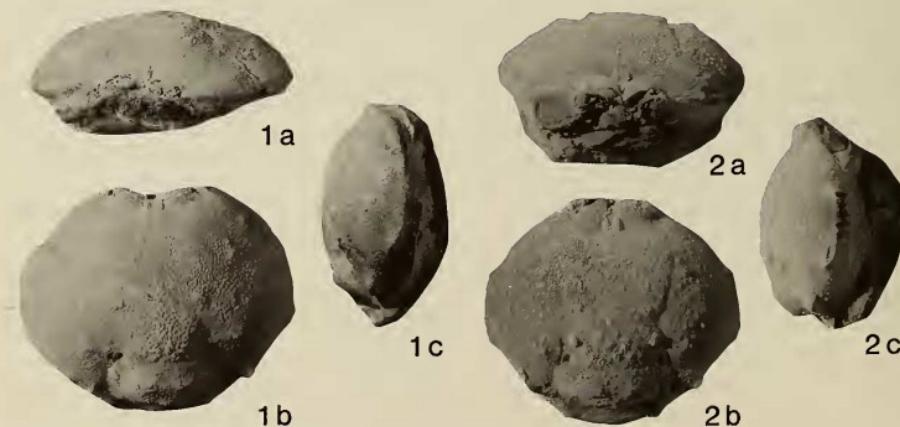


Fig. 2. *Typilobus kishimotoi*, new species. 1a–c, holotype (MFM39017),  $\times 3.0$ . 1a, frontal; 1b, dorsal; 1c, lateral view. 2a–c, paratype (MFM39018),  $\times 3.5$ . 2a, frontal; 2b, dorsal; 2c, lateral view.

		Europe	Indian	NW. Pacific
MIOCENE	M	<i>Typilobus moralejai</i> Müller, 1993 [Spain]	<i>Typilobus sadeki</i> Withers, 1925 [Egypt]	<i>Typilobus kishimotoi</i> [Japan] <i>T. marginatus</i> Morris & Collins, 1991 [Sabah]
	E	Tethys	<i>Typilobus granulosus</i> Stoliczka, 1871 [Pakistan]	<i>Typilobus</i> sp., Morris & Collins 1991 [Sabah]
OLIGOCENE		<i>Typilobus corrugatus</i> (Noetling, 1885) [Germany] <i>T. cfr. corrugatus</i> , Förster & Mundlos, 1982 [Germany] <i>T. birsteini</i> Förster & Mundlos 1982 [Turkmenistan]		
EOCENE		<i>Typilobus belli</i> Quayle & Collins, 1981 [England] <i>T. boscoi</i> Via Boada, 1959 [Spain] <i>T. modregoi</i> Via Boada, 1959 [Spain] <i>T. obscurus</i> Quayle & Collins, 1981 [England] <i>T. semseyanus</i> Lörenthey, 1909 [Hungary]	<i>Typilobus trispinosus</i> Lörenthey, 1909 [Egypt]	

Fig. 3. Geological and geographical distribution of the genus *Typilobus* Stoliczka, 1871.

itudinal ridges behind median sulcus of frontal region. Hepatic region separated from gastric region by shallow groove. Small tubercle on each hepatic region in angle of hepatic and cervical furrows. Cervical furrow distinct, but becoming obsolete before reaching anterolateral margin. Cardiac region strongly tumid, transversely pentagonal in outline, with 3 nodes set in inverted triangle; it is separated from branchial regions by deep grooves and delimited from posterior margin by narrow, flattened intestinal region. Small tubercles on rectangular urogastric lobe near mesogastric lobes.

Ventral aspects unknown.

**Remarks.**—This new species has close affinities with the type of the genus, *T. granulosus*, from the lower Miocene (Aquitian) of Kutch, Pakistan, and *Typilobus sadeki* Withers, 1925, from the middle Miocene (Vindobonian) of West Sinai, Egypt. The new species differs in having small tubercles on the gastric and branchial regions, and in having two longitudinal ridges on

the postorbital depression. Unlike *T. sadeki*, *T. kishimotoi* has a pair of tubercle on each posterior angle. Small granules on the dorsal surface, and a nongranular anterolateral margin, readily distinguish *T. kishimotoi* from the other middle Miocene species, *Typilobus marginatus* Morris & Collins, 1991, from the Segama Group of Sabah, and from *Typilobus moralejai* Müller, 1993, Langhian, Spain by having marginal tubercles and a well defined cardiac region.

The dorsal surface in the smaller specimen is densely covered with small granules, but it in the larger one is finely pitted. The dorsal regions of the smaller specimen are well defined rather than those of the larger. These differences lie in preservations of both specimens. In the smaller specimen the carapace is well preserved, but the larger one shows only internal surface of the carapace.

Early members of *Typilobus* (*T. belli* Quayle & Collins 1981, *T. boscoi* Via Boada 1959, *T. semseyanus* Lörenthey 1898, *T. modregoi* Via Boada 1959, *T. obscurus*

Quayle & Collins 1981, *T. trispinosus* Lörenthey 1909) are known from the middle Eocene of England (Quayle & Collins 1981), Spain (Via Boada 1959) and Egypt (Lörenthey 1909) (Fig. 3). The genus occurs in Oligocene deposits from Germany (Noetling 1885, Förster & Mundlos 1982) and Turkmenistan (Förster & Mundlos 1982). *Typilobus granulosus* has been known from the lower Miocene of Pakistan (Stoliczka 1871), and an unnamed Lower Miocene species is recorded from Sabah (Morris & Collins 1991). By the Middle Miocene the genus was established in Spain (Müller 1993), Egypt (Withers 1925), Sabah (Morris & Collins 1991), and Japan. This sequence of occurrences suggests that the genus originated in the west Tethys, and that migration from the Tethys region to the Indo-West Pacific regions occurred during the Miocene.

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